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Sociodemographic Characteristics And Feeding Practices In Cattle Farms In The Peri-Urban Area Of Bouake, Cote d'Ivoire.

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Abstract
Cattle feeding practices in the peri-urban area of the city of Bouaké were analyzed through a field survey of cattle breeders along the Bouake-Katiola, Bouake-Satama, Bouake-M'Bahiakro, Bouake-Sakassou, Bouake-Béoumi and Bouake- Botro roads. Thirty-eight breeders were subjected to a questionnaire on the social aspects of breeders, breeding practices, available food resources, and health practices and livestock exploitation.
In terms of social aspects, these breeders have an average age of 40 years and 92.1% of them are Muslim. They are 36.8% breeders and 36.8% traders. Cattle fattening represents the type of breeding most practiced by breeders (65.8%). The breeding farms, which represent 34%, all use natural mating. The male remains in the herd until he becomes old and the best of his offspring is chosen to replace him. For feeding cattle in the peri-urban area of Bouaké, 89.5% practice natural grazing compared to 10.5% zero grazing. To compensate for the lack of pasture, feed supplements based on crop residues and agricultural by-products are used by 92.1% of farmers. The majority of these peri-urban breeders (97.4%) believe that it is good to put cassava peelings in granulated form for their better conservation. The selling or purchasing prices of animals depend on the breed, age and sex, the season and especially what the buyer wants to do with them.
To improve the diet of ruminants in peri-urban livestock farming, the use of cassava peelings is a boon because they are produced abundantly in the city.
Keywords: *Cattle breeding, feeding strategy, peri-urban area, Bouake, Cote d'Ivoire*

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I. Introduction

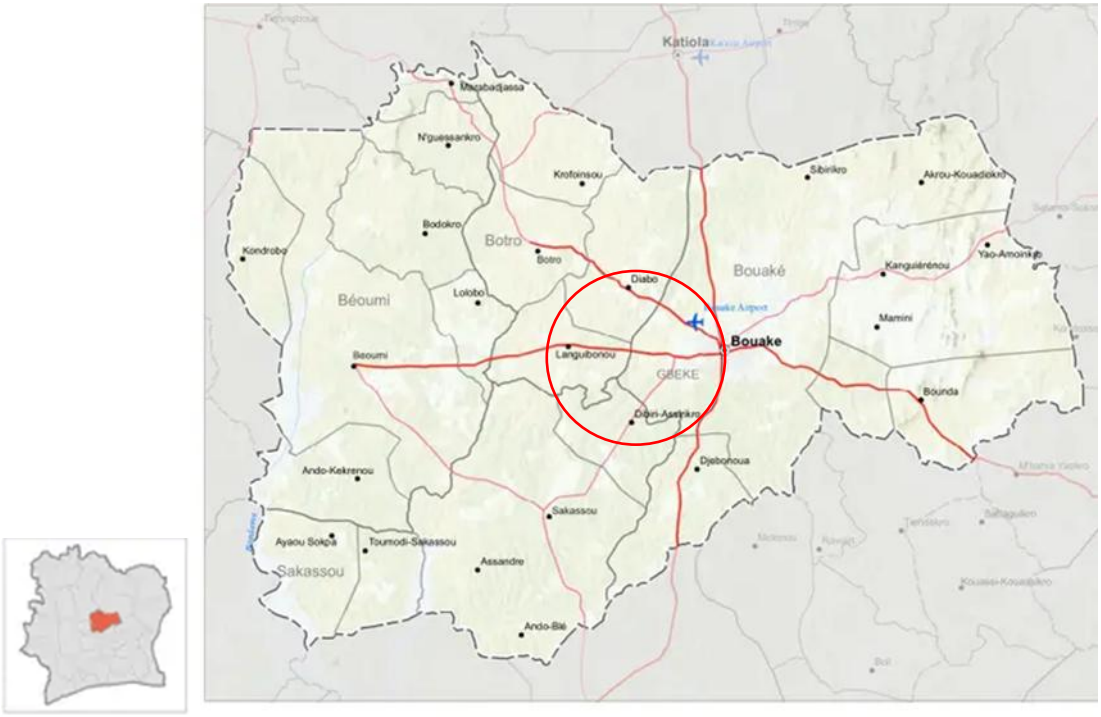
In Côte d'Ivoire, the livestock production sector plays a marginal role in the economy, contributing only 4.5% to agricultural GDP and 2% to national GDP (1, 2). This country is heavily dependent on neighboring countries such as Mali, Burkina Faso and Niger for its animal protein consumption (3). Despite the efforts made by the Ivorian State over several decades, national meat production still remains in deficit with 55.4% for meat and offal and 87.4% for dairy products (4). In terms of employment, the livestock sector has around 700,000 farmers, or less than 5% of the agricultural population (4). Urban and peri-urban ruminant farming is widespread throughout the country, especially in the northern and central regions of the country. However, this farming remains based on extensive traditional production systems (5). In this livestock system, feed is the most important element (6) and it is based almost exclusively on herbaceous and/or shrubby vegetation present in the form of pockets in towns and their surroundings (7). But, faced with rampant urbanization, these spaces are shrinking and breeders are increasingly obliged to do zero grazing or to give their animals much more food supplements **(**8**)**. In this context, it seemed useful to question how these animals are fed in the peri-urban area of Bouake. This study aims to characterize feeding practices in cattle farms in the peri-urban area of Bouake.

II. Material And Methods

Study Location

The survey site is the department of Bouaké, located in the center of Côte d'Ivoire. It has an area of 4,803 km² with a total population of 1,352,900 inhabitants (9). The city of Bouaké is located at 7°41' North latitude and 5°02' West longitude on the major road and rail axis joining Abidjan to the north of the country. The city is spread over a plateau whose essential characteristic is its digitization by a very dense secondary hydrographic network. Its average altitude is 310 m. It is the capital of the Gbêkê region which is a transition between the forested South

and the North. In terms of rainfall, it is characterized by four seasons: a long dry season (November to February), a long rainy season (March to June), a short dry season (July to August) and a short rainy season (September to October) (10). Rainfall levels vary between 1,200 and 1,500 mm per year. The survey was carried out on the Bouake-Katiola, Bouake-Satama, Bouake-M'Bahiakro, Bouake-Sakassou, Bouake-Beoumi and Bouake-Botro roads (Figure 1). The biological material is the set of cattle distributed in the different farms of the peri-urban area of Bouaké. Several breeds have been identified namely the N'Dama, the Zebus, the Goudali and the Tchiwal.



Source: (11).
Figure 1: Study location

Sampling

Based on a brief and structured questionnaire, an interview was conducted with 38 breeders previously informed about the objective of the work and distributed according to the road axes. Bouaké-Katiola: 7, Bouaké-Satama: 6, Bouaké- M'Bahiakro: 6, Bouaké- Sakassou: 7, Bouaké- Béoumi: 6 and Bouaké- Botro: 6. These breeders were selected on the basis of the annual activity report of the Regional Directorate of the Ministry of Animal and Fisheries Resources of Bouaké which estimated in 2021, the number of urban and peri-urban breeders in the city of Bouaké at 300 (4) or a little more than 12% of breeders. The questionnaire covered the socio-demographic characteristics of the farmers, the feed resources used, the costs of supplementation and the costs of buying and selling the animals. The questionnaire on feeding systems covered: are the animals fed in the pen or on the range? Do they have artificial pastures? Are the animals supplemented? If so, during what period of the year? The animals are supplemented with what ingredient and in what quantity on average. What are the difficulties encountered in feeding the animals? etc. The survey was carried out over a period of 21 days and farmers located within a 15 km radius of the city center were interviewed.

Processing and statistical analysis of data

The collected data were recorded using Excel 2013 software (scanning matrix). This same tool was used to plot the graphs and then the analyses were carried out using IBM SPSS Statistics version 22.0 software.

III. Results

Social characteristics of farms

The survey was conducted on a sample of 38 breeders whose average age was 40 years, with a maximum of 77 years and a minimum of 18 years. It also emerged that 92.1% were Muslims and 7.9% were Christians. The main activity was equally dominated by breeders and traders with 36.8% (Table 1, Figure 2).

Table 1: Social characteristics of cattle farms

Variables		Frequencies	Rate (%)
Religion	Christian	3	7.9
	Muslim	35	82.1
Main activity	Breeder	14	36.8
	Trader	14	36.8
	Carrier	3	7.89
	Teacher	2	5.26
	Farmer	2	5.26
	Student	2	5.26
	Blacksmith	1	2.63

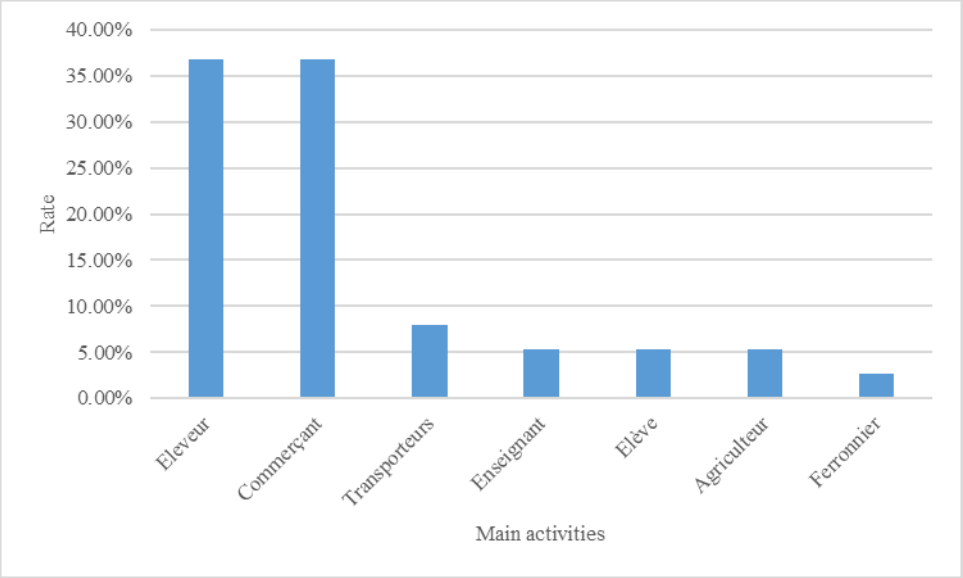


Figure 2: Main activities of breeders

Breeding system practiced

The breeding systems practiced are indicated in Table II. Cattle fattening is practiced by the majority of breeders (65.8%) compared to cow-calf rearing which is 34.2%. It generally lasts 6 months for 60% of breeders and 12 months for 40% of them. On the various farms visited, it appears that 100% of breeders do not castrate the animals. The cow-calf farms, which represent 34%, all use natural service (100%), and the bulls are generally from the herd. These breeders attach great importance to the choice of sires because, according to them, the future of the farm depends on it. Milk production is practiced by 28.9% of these cow-calf breeders, and the quantity of milk generally varies according to the seasons. The minimum milk production is in the dry season and amounts to 1 litre on average per cow per day while the maximum is produced in the rainy season and is 3 litres per cow on average per day.

Table 2: Livestock system practiced

Variable		Breeders' number	Rate (%)
Breeding system	Mouthpiece	25	65.8
	Breeder	13	34.2
Fattening period	Dry season	18	72
	Rainy season	7	28

Feeding practices

Natural grazing is the most used for feeding cattle in the peri-urban area of Bouaké (89.5%) compared to 10.5% for zero grazing (Figure 3).

To compensate for the lack of pasture, 92.1% of these farmers use crop residue-based feed supplements throughout the year. Those who do not use crop residues (7.9%) explain this by the fact that the farm is located in an area where vegetation is abundant.

The difficulties are multiple and varied, mostly depending on the livestock system. According to Table III, the unavailability of pasture (73.3%) constitutes the major difficulty in peri-urban farms in Bouaké, followed, in equal parts, by the unavailability of by-products (13.3%) and the high cost of these by-products (13.3%).

In order to provide solutions to the various problems, the majority of these peri-urban breeders (97.4%) believe that it is good to put cassava peelings in granulated form for their conservation while 2.6% of them think that this will lead to additional costs.

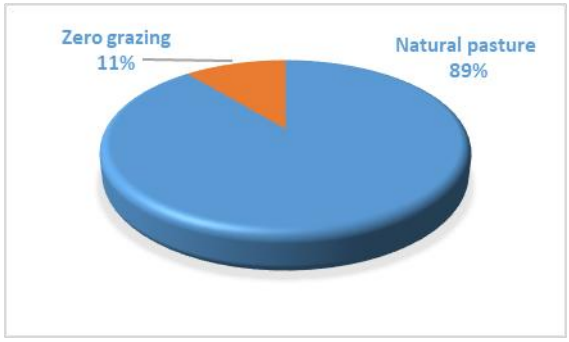


Figure 3: Grazing system

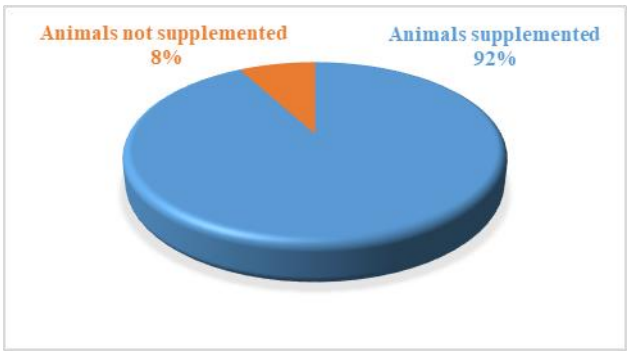


Figure 4: Use of food supplements.

Table 3: Major difficulties in peri-urban livestock farming

Variables	Number of breeders	Rate (%)
Pasture unavailability	28	73.3
High cost of by-products	5	13.3
Unavailability of by-products	5	13.3

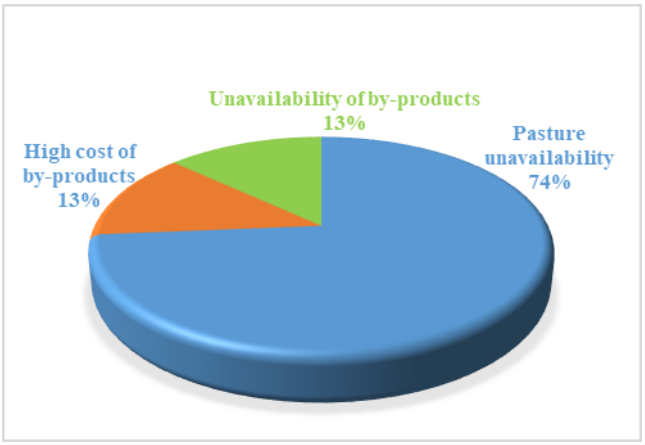


Figure 5: Major eating difficulties encountered

Food costs

The average feed purchase costs per year and per animal presented in Table IV vary according to the type of livestock (fattening or breeding) and the distance of the farm from the city center (where the feed supplements are located) and the purchasing period (dry season or rainy season). This table indicates that regardless of the season, livestock farmers do not pay for green fodder for animals on pasture. The feed cost of fodder and feed supplements decreases from the dry season to the rainy season.

Table 4: Food cost depending on the system

System	Average monthly cost of green fodder per animal (FCFA)		Cost per season of food supplement per animal (FCFA)	
	Dry season	Rainy season	Dry season	Rainy season
Zero grazing	4,975 ± 889.4	2,335 ± 750	7,056 ± 1,466	6,049 ± 1,376
On pasture	0	0	4,394 ± 848	3,503 ± 1,689

IV. Discussion

Socially, all breeders are male and of an age average of 40 years. This is corroborated by the study of (5) who, after a survey of peri-urban cattle farms in Abidjan, concluded that all the breeders were male and have an average age between 20 and 40 years. Similarly, according to (12), through a study carried out in Daloa in Ivory Coast, livestock farming in the city of Daloa is mainly in the hands of adults over 40 years of age with a proportion of 79.7%. It also turns out that 92% are Muslim. Cattle breeding is an activity practiced mainly by people from the northern part of the country who are predominantly Muslim regardless of the breeding area in Côte d'Ivoire. This is in line with the results of the survey conducted by (12). According to the author, 93.1% of peri-urban breeders in the cities of Côte d'Ivoire are Muslim compared to 1.5% Christians. According to this study, the owners of the animals are mainly breeders and traders 37%, followed by transporters at 8% and teachers, farmers and students 5%. These farmers have, for the most part, another activity in addition to being breeders in order to diversify their sources of income. According to (13), in a study carried out in Thiès, Senegal, which has the same aim of diversifying sources of income, peri-urban farmers are 24.44% breeders, 22.22% traders and 20% workers.

These peri-urban farms are 34% breeders. Natural mating is practiced 100% on these farms and all the breeder farms produce milk. These results are contrary to those of the study by (13) conducted in Senegal. According to the author, the herd is of the breeder type (80%) and the breeders who do fattening and milk production are respectively 15.6 and 4.4%. The male is chosen according to criteria such as size and coat color, and remains in the herd until exhaustion and one of his young is chosen to replace him. That is to say, he mounts his daughters and/or his sisters. This would be the basis of inbreeding problems leading to stillbirths that the breeders have reported. This inbreeding problem is reported by (14) who found that the geographical distance between farms and their selection criteria limit the exchange of breeders and therefore genetic mixing. These same authors also found that the low population size that still characterizes herds today justifies the high level of inbreeding.

Natural grazing is the most used feeding method (89.5%) compared to 10.5% who practice zero grazing. Contrary to the results of the survey conducted by (12) which show that animals are fed on site in 54.1% of farms or are taken out of town to graze, i.e. 30.1% of respondents. Those who let animals wander in the street are fewer (10.5%). Agricultural residues and by-products are used in all seasons in 92% of farms. The 8% of farms that do not use them do so because they are far from the production center of these ingredients, or they have green grass available. (5), on the other hand, find that the high costs of agro-industrial by-products (SPAI) would constitute the main obstacles to the intensification of animal production. Speaking of accessibility to feed, more than 73% of farmers have as a major difficulty the unavailability of pasture against, in equal part of 13.5%, the unavailability of by-products and their high cost. This is in line with the study (5) on peri-urban farms of Abidjan where feed is the major constraint of livestock units, marked by the low availability of grazing areas. Cassava peelings being the most used by-product, 97% of farmers believe that, to make them available in all seasons, they must be put in granulated form. Because, in the dry season when animals most need to be supplemented at a lower cost with cassava peelings, it is rare to find them because it is difficult at this time to dig up cassava. This is confirmed by a survey conducted by (15) among cassava processors in Yamoussokro, who recorded that, in the rainy season, they produce 80% of the annual quantities of cassava peelings compared to 20% in the dry season. Whatever the feed, fodder or supplement, the feed cost per animal per month in the dry season is higher compared to that of the rainy season. This is due to the fact that green fodder is scarce in the dry season, so the selling prices are high. The cost of the feed supplement increases in the dry season because it is used a lot during this period of grass scarcity. This assertion is verified by (16). According to the authors, the use of peelings in the dry season is explained by the absence of fodder during this season for feeding their animals. Also, they consider agro-industrial by-products as an important food resource to cope with livestock feeding difficulties caused by climate change with fodder deficit.

V. Conclusion

Peri-urban cattle farming is of great importance because it allows animals to be kept close to consumers. But their management, especially for food, is increasingly difficult given the scarcity of fodder due to rampant urbanization and the harsh dry season. Cassava peels are a boon because they are produced mainly in cities. But this production declines during the dry season due to the difficulty of harvesting cassava during this season.

However, during the rainy season, this by-product is abundant and often discarded. Converting dried cassava peels into granulated form would allow their preservation and availability in all seasons.

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